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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,304	09/18/2003	Madapusi K. Keshavan	49524/CM/M277	5445

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EXAMINER

MAYES, MELVIN C

ART UNIT PAPER NUMBER

1734

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/665,304

Applicant(s)

KESHAVAN ET AL.

Examiner

Melvin Curtis Mayes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/23/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

(1)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(2)

Claims 3 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3 claims “said substrate first portion extends over the first portion” and the layer is placed over the “second portion.” According to the specification, if the second portion is fully densified (as claimed in Claim 2 from which Claim 3 depends), the first portion extends over the second portion and the layer is placed over the first portion. Claim 3 would be clearer if read that the first portion extends over the second portion and layer is placed on the first portion.

Claim 4 claims that that the layer is placed over at least a portion of the second portion. It is not clear how Claim 4 further limits claim 3 because Claims already claims that the layer is placed over the second portion.

Claim Rejections - 35 USC § 102

(3)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

(4)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(5)

Claims 1, 7-14 and 17-24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Komanduri 4,797,138.

Komanduri discloses a method of making a cutting tool comprising: providing cemented carbide substrate of porosity of less than 15% by volume; providing the substrate with at least one partition which divides the support surface of the substrate into at least two discrete support areas; filling the support areas with a layer of crystals of diamond or cubic boron nitride; and heating under high pressure and high temperature to a temperature above the melting point of the cementing agent of the cemented carbide to bond the crystal together and to the substrate to produce a composite; and slicing through the partition to form cutting tools (col. 2-4).

Further, by providing crystals of diamond or cubic boron nitride for filling the support areas, an ultra hard material which is not fully densified is obviously provided, as claimed

Further, by providing a cemented carbide substrate of porosity less than 15% by volume (i.e. at least greater than 85% of full density), a substrate is selected which at least has a portion or its entirety of density that is less than 100% of full density, as claimed, such as within the ranges of 70-90%, 40-90% or 75-99% of full density as claimed in Claims 8-9 and 18-21 and within the range of 1-30% porosity, as claimed in Claims 11 and 22.

(6)

Claims 1-6, 8-16 and 18-33 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Aronsson et al. 4,764,434.

Aronsson et al. disclose a method of making a diamond tool comprising: providing diamond powder; providing a support comprising a support body of cemented carbide and thin PVD or CVD applied coating of titanium nitride; placing the diamond powder on the coated surface; and sintering at high pressure and high temperature. The surface of the support body can be provided with depressions, recesses or grooves (col. 1-3).

Further, by providing the cemented carbide body as coated with a PVD or CVD applied coating of titanium nitride, a substrate having a portion (the coating) with a density less than 100% of full density and second portion (the cemented carbide body) that is different in density or fully densified is obviously provided, as claimed, for controlling the magnitude of sintering-induced stresses generated, as claimed.

Further, providing the coating (portion of the substrate) as having a density or porosity in the ranges as claimed in Claims 8-11, 18-22 and 26-30 would have been obvious to one of ordinary skill in the art as the results of applying a coating of titanium nitride by PVD or CVD.

(7)

Claims 1-6, 8-11, 13-16, 18-30, 32 and 33 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Burnand et al. 4,802,895.

Burnand et al. disclose a method of making a diamond abrasive compact comprising: providing diamond particles; providing a support comprising a cemented carbide body having a

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layer of carbide powder on its surface; placing a layer of diamond particles on the carbide powder layer; and applying high temperature/high pressure (col. 2).

Further, by providing the cemented carbide body as having a layer of carbide powder, a substrate having a portion (the powder layer) with a density less than 100% of full density and second portion (the cemented carbide body) that is different in density or fully densified is obviously provided, as claimed, for controlling the magnitude of sintering-induced stresses generated, as claimed.

Further, providing the powder layer (portion of the substrate) as having a density or porosity in the ranges as claimed in Claims 8-11, 18-22 and 26-30 would have been obvious to one of ordinary skill in the art as the results of providing a layer of carbide powder.

(8)

Claims 1-6, 8-11, 13-16, 18-30, 32 and 33 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hall et al. 4,604,106.

Hall et al. disclose a method of making a diamond compact such as for cutting (cutting element) comprising: providing a cemented tungsten carbide substrate coated with a mixture of precemented carbide and diamond crystals with cobalt binder material; placing a layer of diamond crystals against the mixture; and applying high temperature and pressure to bond the diamond crystals. Due to the mixture applied to the carbide substrate, residual stresses between the substrate and diamond are reduced (col. 5-8).

Further, by providing the cemented tungsten carbide substrate as coated with a mixtures of precemented carbide and diamond crystals to reduce residual stresses, a substrate having a portion (the coating) with a density less than 100% of full density and second portion (the

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cemented carbide substrate) that is different in density or fully densified is obviously provided, as claimed, for controlling the magnitude of sintering-induced stresses generated, as claimed.

Further, providing the coating (portion of the substrate) as having a density or porosity in the ranges as claimed in Claims 8-11, 18-22 and 26-30 would have been obvious to one of ordinary skill in the art as the results of applying a coating of precemented carbide and diamond crystals.

(9)

Claims 1, 7, 13, 14, 17, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vale et al. 6,779,951 in view of Bovenkerk et al. 4,311,490.

Vale et al. disclose a method of making a drill insert (cutting element) comprising: load a carbide mass 101 in a can bottom; loading polycrystalline diamond crystals 102 or precompacted tape of a superabrasive constituent on the carbide mass; applying high temperature and pressure sintering conditions to cause the metal binder in the carbide mass to promote sintering of the diamond crystals (col. 5, lines 16-44).

Bovenkerk et al. teach that a carbide mass for bonding to a mass of abrasive crystals such as diamond or cubic boron nitride in a high temperature/high pressure process may be provided a mass of carbide powder in admixture with a bonding metal which functions as a metal bond for sintering the carbide for making the sintered carbide support (col. 2, line 5 – col. 4, line 14).

It would have been obvious to one of ordinary skill in the art to have provided the carbide mass in the method of Vale et al. as a mass of carbide powder in admixture with the metal binder, as taught by Bovenkerk et al., as carbide mass used for bonding to abrasive crystals in a

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high temperature and pressure process. By providing the carbide mass as a mass of carbide powder in admixture with the metal binder, a substrate is selected which at least has a portion or its entirety of density that is less than 100% of full density, as claimed.

Conclusion

(10)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cerutti et al. 5,773,140 discloses using a layer of sinterable carbide powder mixed with metal binder. Renick et al. 5,858,539 disclose providing a cemented carbide powder with a particle coated surface. Cutler 5,952,102 discloses sintering a carbide body to greater than 95% density before coating with diamond. Lee et al. 4,110,084 discloses using a silicon carbide substrate having 85-98% of theoretical density. Csillag 4,797,326 discloses placing a diamond compact having pores throughout on a metal carbide substrate either presintered or only pressed into a shape.


(11)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
March 2, 2006